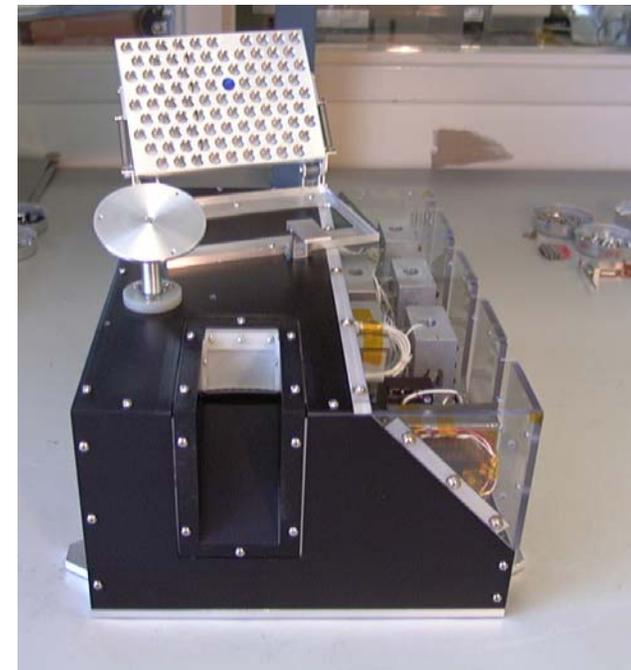


# Relationship-centered management in a small project



**Michael Hecht**  
**MECA Project Manager**  
**MECA co-investigator**



# Brief history of MECA



- **June, 1997:** AO released for a \$5M supplemental payload on the Mars 2001 Surveyor Lander. Topic was dust & soil analysis in support of eventual human exploration. Scope was “ambitious.”
- **February, 1998:** MECA, an “outsider” team was selected, 3 months late, for a April, 2000 delivery of four, all-new instrument designs.
- **Feb-March:** MECA team assembled and began work. Low visibility to mgmt.
- **April, 1998:** Work stopped for 2 months as Lander was reconfigured.
- **July, 1998:** MECA approved to resume
- **December, 1999:** MPL crash. MSP ‘01 cancelled shortly after.
- **June, 2000:** MECA delivered successfully, on time, exceeding proposed capability but ~20% over budget
- **Today:** MECA EM sits in a display case in JPL’s museum, dreaming of 2007.

# The Mars Environmental Compatibility Assessment: A Prototype Microlaboratory

Developed for the 2001 Mars Surveyor Lander, MECA combines chemical, microscopic, and electrostatic analysis of martian soil.



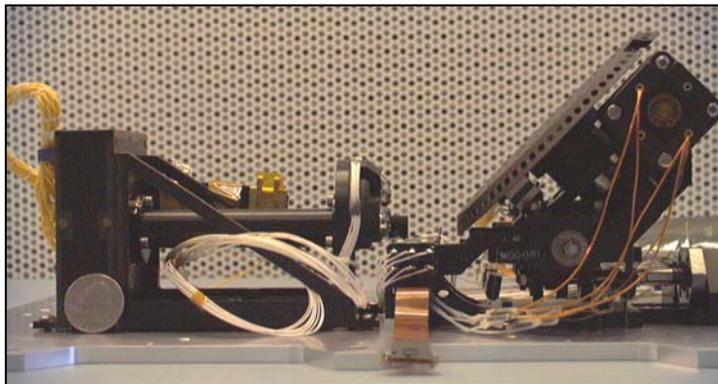
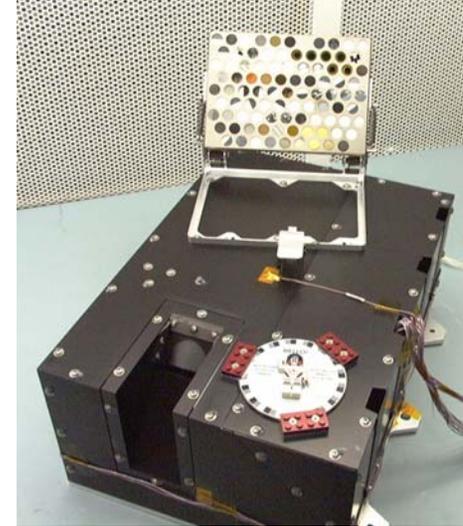
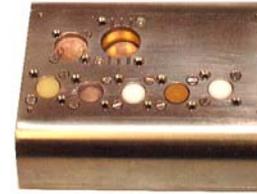
**M**icroscope: Optical and Atomic Force Microscopes image mineral and rock grains, measure morphology, hardness, magnetic and electrostatic properties.

**E**lectrometer: Electrical field, triboelectric charging, and airborne charge sensors characterize the electro-static environment

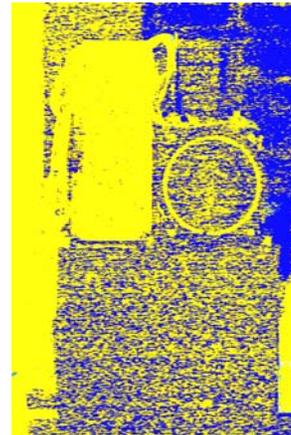
**C**hemistry Cell (1 of 4): This "Laboratory in a Teacup" performs 26 analyses of pH, redox, conductivity, and dissolved salts in a soil-water mixture

**A**dhesion (Patch) Plate: Camera images allow investigators to perform "nanoexperiments"

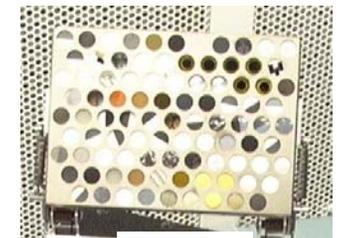
← 7 cm →



← 30 cm →



← 8 cm →



← 16 cm →

# The core team



- **Constraint:** Few flight-experienced JPL “A-team” were available (too bad!).
- **Approach:** Retain creative innovators with cosmopolitan perspective, irrespective of flight background - in short, the proposal team. Build org chart around them.
- **Result:**
  - 5-7 core members, co-located in combination office, lab, conference room. Augmented by discipline specialists.
  - Mostly “technologists” (JPL lingo for R&D scientists in non-space disciplines).
  - A mostly-young staff with busy lives (2 in degree programs, 5 had babies during project!)
  - PM and Instrument leads were experimental physicists & chemists who were also science co-investigators. Most, including PM, had no flight experience.
  - Most team members *and contractors* were involved from the proposal stage

# Selected Project Values



- Relationships over processes
- Nobody is indispensable, everyone needs a backup.
- Time is precious. Don't send two to do the job of one. Meetings are optional or parallel-processed.
- Nudge people out of their comfort zones.
- Treat contractors like in-house organizations, and vice versa (they did better!).
  - Project commits to contractor health, and vice versa.
  - Trade on strong personal relationships with medium-sized companies.
- The Project is a scavenger hunt. Commend those who find the mistakes.

# People Story: Mitch Shellman



**Educational Background:** Vietnam Vet with an A.A. in business. Started career as custodian in an aerospace firm.

**Family:** Wife, two teenage kids.

**Aspirations:** Project Management (!).

**JPL job before MECA:** Procurement official, specializing in flight instrument hardware

**MECA Role:** Instrument Manager and *de facto* Deputy PM

**Something I learned:** After a presentation, questions are *bad* if you're in Contracts, good if you're in Research.

**Mitch died of a heart attack in December, 1998.**

# People Story: Tom Meloy



**Background:** A Harvard-educated physicist, son of a captain of industry. Expert in particle science, from bio-agents to jet engines. Last NASA job was *predicting* consistency of lunar soil. Meloy Industry projects ranged from lunar sample receiving facility to a mouse-milk dairy.

**Family:** Proud grandfather. Lost his wife of 50 years just months before joining MECA.

**Aspirations:** To get married again.

**Before MECA:** Left NSF for WVU when he was told he had 6 months to live. That was 20 years ago. The doctor is dead. Meloy now teaches particle science and ethics.

**MECA Role:** Principal Investigator. Mentor.

**Something I learned:** How fortunate we are to have the opportunity to “place a tile in the corridor of history.” How to lift morale every time you come into town. Tom’s first question was always “who should I take out to dinner?”

# People Story: Chuck Bryson



**Background:** Raised in the oil fields, went into Physics when he realized that none of his male relatives had 10 fingers. Fired from his first job, with NASA JSC, for unauthorized innovation. Successful Project Leader at HP, started a vacuum technology company with 4 friends, eventually cashed in and started his own firm.

**Family:** Several grown kids and an adored little girl by his second wife.

**Aspirations:** To make millionaires of his 10 best friends.

**Before MECA:** Converting his hi-tech hobby shop into a retirement nest egg.

**MECA Role:** Contractor and mentor. His firm delivered the sample handling system.

**Something I learned:** Doing business with the government is risky. The Project can help mitigate the risk.

# MECA Team ~4/98

